UMTA-MA-06-0152-86-3
DOT-TSC-UMTA-86-13

epartment
nsportation

Urban Mass
Transportation
Administration

Development of an Automated Security Incident Reporting System (SIRS) for Bus Transit

Transportation Systems Center
Cambridge MA 02142

December 1986
Final Report

UMTA Technical Assistance Program

NOTICE

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

NOTICE

The United States Government does not endorse products of manufacturers. Trade of manufacturers' names appear herein solely because they are considered essential to the object of this report.

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
UMTA-MA-06-0152-86-3	PB87-172789/AS	

4. Title and Subtitle

DEVELOPMENT OF AN AUTOMATED SECURITY INCIDENT REPORTING SYSTEM (SIRS) FOR BUS TRANSIT.

5. Report Date
December 1986

6. Performing Organization Code
DTS-43

7. Author(s)
Nancy A. Cooney

8. Performing Organization Report No.
DOT-TSC-UMTA-86-13

9. Performing Organization Name and Address
U.S. Department of Transportation
Research and Special Programs Administration
Transportation Systems Center
Cambridge MA 02142

10. Work Unit No. (TRAIS)
MA-06-0152
UM678/U6603

11. Contract or Grant No.
MA-06-0152

12. Sponsoring Agency Name and Address
U.S. Department of Transportation
Urban Mass Transportation Administration
400 Seventh Street, S.W.
Washington DC 20590

13. Type of Report and Period Covered
Final Report
September 1985-August 1986

14. Sponsoring Agency Code
URT-6

15. Supplementary Notes

16. Abstract The Security Incident Reporting System (SIRS) is a microcomputer-based software program demonstrated at the Metropolitan Transit Commission (MTC) in Minneapolis, MN. SIRS is designed to provide convenient storage, update and retrieval of security incident data. The program utilizes data from dispatcher, bus operator, security officer, and municipal police reports. Drawing on this data, the program produces standard reports, summarizing incident frequency, type, time, location and other attributes. In addition, the system can be queried to provide ad hoc statistical information, and individual incident records can be retrieved for inspection. Although SIRS was designed to meet the requirements of MTC, it has applicability to transit bus systems in general and can be modified to meet the varying input and output requirements of other transit systems.

Section 1 of this report describes the need for efficient and accurate security incident data reporting within the transit industry and discusses the role of automation in improving the reporting process. Section 2 of the report outlines the relevant characteristics of MTC and its security department. Section 3 details the design of the SIRS system and the functions it can perform. Lastly, Section 4 describes the applicability of SIRS to the transit industry in general and recommends future efforts to promote the use of automated reporting systems like SIRS.

17. Key Words	18. Distribution Statement
Automated Reporting System; Bus Crime; Computer Program; Crime; Metropolitan Transit Commission; Minneapolis, MN; Reporting System; Safety; Security; Security Incident Reporting Systems; SIRS	DOCUMENT IS AVAILABLE TO THE PUBLIC THROUGH THE NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD VIRGINIA 22161

19. Security Classif. (of this report)	20. Security Classif (of this page)	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	39	A03

PREFACE

This report, prepared by the Transportation Systems Center (TSC) for the Urban Mass Transportation Administration's (UMTA) Office of Safety and Security, describes the microcomputer-based Security Incident Reporting System (SIRS) demonstrated at the Metropolitan Transit Commission (MTC) in Minneapolis, MN.

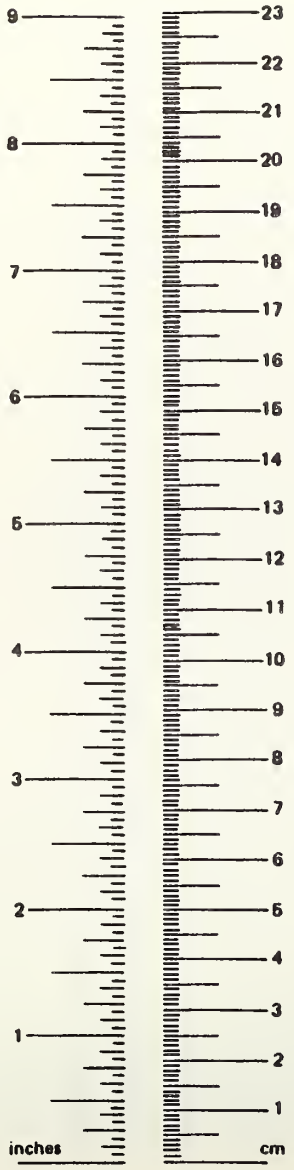
The author wishes to acknowledge the support provided by Gwendolyn R. Cooper of UMTA's Office of Safety and Security. This demonstration was performed under the general direction of William T. Hathaway of TSC's Safety and Security Division. The author is also grateful for the important contributions made by the following individuals: John Bennett and Bhasker Agarwal of Automated Sciences Group, who developed the initial system design and program software; Richard Daesen and Arpy Aghazarian of Systems Development Corporation, who enhanced the original software and wrote the User's Manual; Dana Harris, former MTC Director of Security, who conceived the idea for SIRS and was actively involved in all stages of its development; Gary White, Reynaldo Rodriguez and Celeste Jackson of the MTC Security Department, who put the system into operation; and finally Martin McKinsey of Dynatrend, Inc., who provided excellent editorial support for the publication of this report.

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

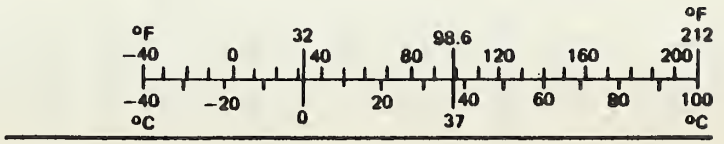
Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in. = 2.54 cm (exactly). For other exact conversions and more detail tables see NBS Misc. Publ. 286, Units of Weight and Measures. Price $2.25 SD Catalog No. C13 10 286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hecteres (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	querts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	36	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



CONTENTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

1.1 PURPOSE OF REPORT

Despite the trend toward computerization in the transit industry, many systems still utilize manual methods for collecting and analyzing information related to security incidents. These manual methods do not promote the easy identification of recurring security problems and the initiation of a suitable, timely response. Due to the increasing availability and affordability of microcomputers, transit systems now have an excellent opportunity to improve their efficiency in this area.

This report describes a microcomputer-based Security Incident Reporting System (SIRS) developed to provide the transit industry with a means of enhancing passenger security. Demonstrated at the Metropolitan Transit Commission (MTC) in Minneapolis, MN, the SIRS program is used to record security incident information and produce standard statistical reports. The system can be queried to provide security-related statistics upon request, and individual security incident reports can be retrieved for inspection.

Although demonstrated at MTC, SIRS was designed to meet the requirements of transit bus systems in general. Because of its flexible structure, SIRS can be modified to meet the varying input and output requirements of other bus systems. This report provides an overview of the development of SIRS and its demonstration at MTC, and is designed to acquaint the reader with the capabilities of the SIRS system. More detailed information on the operation of SIRS is contained in the SIRS Users' Manual, available upon request from the Transportation Systems Center.

1.2 NEEDS OF THE INDUSTRY

Data collection and analysis are essential parts of maintaining and improving transit security operations. The availability of reliable data allows a transit system to assess the extent of security problems, to detect trends in security incidents over time, and to evaluate the effectiveness of security countermeasures. In addition, such data assist in the efficient deployment of security personnel by identifying high crime locations.

On an industrywide level, security data collection by local transit systems represents an initial step toward the development of an industrywide reporting system. Such a reporting system would be useful for assessing national trends in security incidents, for developing solutions to generic transit security problems, and for sharing information on the effectiveness of security countermeasures thoughout the industry.

1.3 DATA AUTOMATION IN THE TRANSIT INDUSTRY

The level of automation associated with data collection and analysis functions varies throughout the industry. At present, however, the use of automation is increasing at a rapid rate. Many systems have automated payroll and accounting functions. Automation presents transit systems with the advantages of improved data access, ability to analyze large quantities of data quickly, and increased capacity for storing large amounts of data. The extent to which security incident data collection is automated parallels the general level of automation within the industry.

The increasing availability of microcomputers presents advantages in the automation of transit system data. The cost of acquiring the necessary hardware and software is within the reach of most systems, and the skills necessary to operate the system can be acquired by existing personnel.

1.4 TRANSIT SECURITY DATA COLLECTION PRACTICES

1.4.1 Scope of Data Collection Activities

Transit security data collection was the subject of a recent study sponsored by UMTA (Hargadine and Scott, 1985). The findings of this study indicate that the extent and type of data collection varies according to the size of the system and the functions that its security department performs.

In terms of security operations, transit systems generally rely on one of the following types of security forces:

1. An in-house police force;
2. A dedicated unit of the municipal police force;

3. Contracted private security coverage;
4. No security coverage except for municipal police backup.

Large transit systems tend to have their own police force or a dedicated municipal unit, while smaller systems often contract for private coverage or have no security coverage except for municipal police backup.

The type of security incident information collected depends to a large extent on the type of security operation involved. Most systems gather basic data such as incident type and frequency as a means of tracking overall trends in transit crime. Systems involved in deploying their own security or police officers typically collect data on time and location of security incidents in order to most efficiently allocate these personnel. Systems responsible for apprehending and prosecuting suspects need further information, such as suspect descriptions, names and addresses of victims and witnesses, as well as circumstances surrounding an incident.

1.4.2 Data Collection Sources

Transit systems collect information on security incidents from a variety of sources, some of which are listed below:

1. Bus drivers - Since drivers are usually present at the scene of an incident, they are a primary source of information. Most systems require drivers to fill out a report on any significant incident occurring during their shift.
2. Dispatchers - When drivers call into a control center to request assistance, the dispatcher records information on the incident. Dispatchers are often required to submit incident reports.
3. Security officers - These officers are often required to submit reports describing incidents which they have handled on their shift.
4. Police officers - Municipal police called to the scene of an incident submit incident reports to their own department. These reports are usually available to transit systems upon request.
5. Damage reports - Maintenance personnel at many transit systems are required to submit reports on the extent and cost of vandalism-related damage.

6. Customer complaints - Formal customer complaints sometimes relate to security incidents witnessed on the transit system.

Transit systems rarely use all of these sources in their security data collection procedures. The types and number of sources used will affect how information is input into a security incident reporting system like SIRS.

2. APPROACH TO SIRS DEVELOPMENT

SIRS, although a generic system, was developed to address the requirements of the Metropolitan Transit Commission (MTC) in Minneapolis, MN. The following sections provide an overview of MTC transit operations and the structure and function of its security department.

2.1 BACKGROUND

The Metropolitan Transit Commission was created by the State of Minnesota in 1970 as the result of the public takeover of a private carrier. At that time, MTC also assumed a coordinating role for smaller private transit companies operating in the area. MTC is one of the largest all-bus systems in the country, operating approximately 810 buses on a daily basis. MTC also operates 40 paratransit vehicles. The MTC system encompasses a seven-county area around Minneapolis and St. Paul, and operates in some 95 smaller cities and jurisdictions.

The MTC Security Department staff consists of a chief of security, a part-time security coordinator, and a part-time student intern. In addition, MTC employs 60 part-time security officers to patrol the bus system. The security officers are drawn from the ranks of off-duty Minneapolis and St. Paul municipal police officers. The security coordinator, also an off-duty officer, is responsible for deploying these officers on the bus system. Every two weeks, officers are assigned to specific bus routes for 4-hour shifts. The part-time student intern is responsible for inputting data to SIRS and generating reports from the system.

2.2 MTC SECURITY INCIDENT REPORTING PROCEDURES

Security incident information for incorporation into the SIRS database is gathered from four sources:

1. Dispatcher Special Situation Reports;
2. Bus driver Special Incident Reports;
3. Security officer duty reports;
4. Municipal police incident reports.

Figure 2-1 represents an overview of SIRS, showing the sources of input data and the output reports produced.

When a driver calls into the Transit Control Center requesting assistance, the dispatcher fills out a "Special Situation Report" describing the incident in question. Requests for assistance are made in response to security incidents and other situations, such as accidents, mechanical problems, injury, and sickness. All Special Situation Reports are sent to the MTC Security Department on a regular basis.

Drivers must fill out a "Special Incident Report" for any significant incident they witness. Usually the Control Center asks the driver to fill out such a report when an incident is called in. In cases where incidents were not called into the Control Center, the garage manager may request that drivers complete such reports, or drivers may fill out reports on their own. All Special Incident Reports are collected and sent to the Security Department.

Security officers involved in handling a security incident are required to describe the incident on their duty sheets, which are sent to the Security Department on a weekly basis.

In cases where the municipal police have been called to the scene, the Security Department will request a copy of the police report on the incident from the appropriate police department.

Samples of the four reporting forms used as input to SIRS are presented in the Appendix.

2.3 MTC SECURITY INCIDENT CLASSIFICATION

As stated above, the MTC incident reporting system is designed to utilize dispatcher and bus operator reports which deal with all reported incidents, security and nonsecurity alike. As shown below, the incident categorization schema used by MTC contains 20 categories, of which the first 10 are security-related incident categories, and the last 10 nonsecurity incident categories:

1. Fare evasion or dispute;
2. Driver interference (delay of operations);
3. Prohibited activity (smoking, eating, drinking, loud radio, etc.);

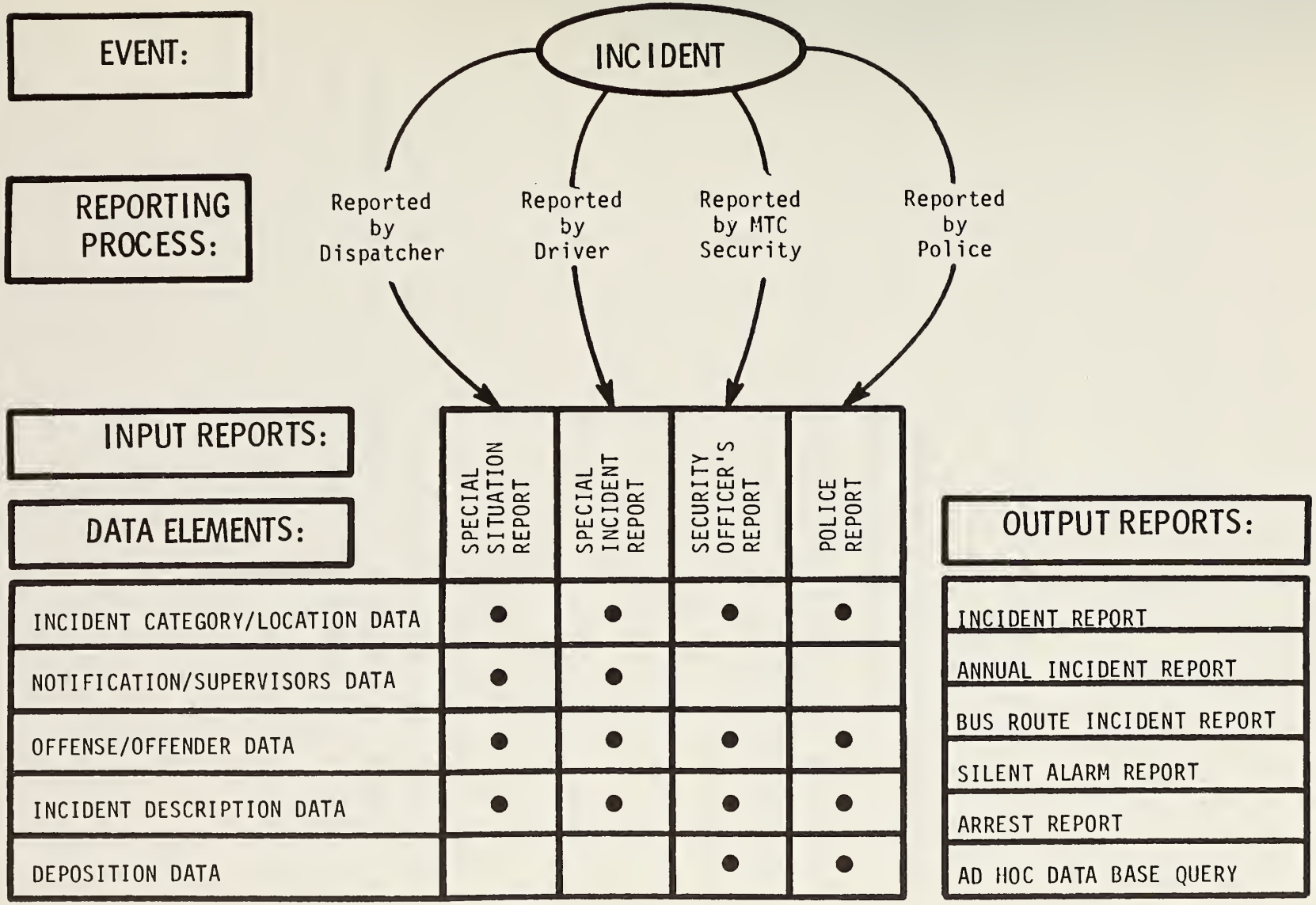


FIGURE 2-1. OVERVIEW OF SIRS

4. Assault, threat against driver;
5. Assault, threat against passenger;
6. Theft (property taken without authorization);
7. Robbery (property taken from a person by force);
8. Vandalism;
9. Intoxicated person (including person asleep on bus);
10. Miscellaneous (security-related);
11. Miscellaneous (transportation-related);
12. Witness report (MTC or bus not involved);
13. Silent alarm (life threatening or medical emergency);
14. Silent alarm (false);
15. Lost/late service;
16. Vehicle accident;
17. Passenger accident;
18. Pedestrian accident;
19. Illness/injury (driver);
20. Illness/injury (passenger).

The SIRS database incorporates all of these categories, including nonsecurity incidents. For purposes of analysis, the user can screen out all nonsecurity incidents when generating reports, so that only security incidents are included.

3. SIRS DESIGN

3.1 SIRS HARDWARE AND SOFTWARE REQUIREMENTS

As deployed at the Metropolitan Transit Commission, SIRS runs on a hardware package consisting of an IBM Personal Computer (PC) with 256K memory and a 10MB hard disk. SIRS can be run, however, on any IBM PC-compatible computer with equivalent memory and storage capacity. For systems as large as MTC, a 10MB hard disk is probably necessary, but for smaller systems less storage may be adequate. Peripheral equipment used at MTC in conjunction with the IBM PC include a monochrome monitor and a dot matrix printer. MTC is planning to purchase a graphic board to provide a graphic capability.

SIRS software, running under the MS-DOS 2.11 operating system, is written in dBASE III. The dBASE III software package is a relational database system, which includes its own programming language and various utilities, such as a screen editor and a help function. When the SIRS application programming was complete, a compiler program, Clipper, was used to create a compiled version of SIRS. The compiled version operates at greatly increased processing speeds.

3.2 SIRS MENU STRUCTURE

The SIRS program is accessed through a series of menus and formated screens. Figure 3-1 shows an overview of the SIRS main menu structure and the various submenu functions available.

The submenus are accessed from the SIRS main menu. Each menu selection has a corresponding screen. Once a screen has been called up, the user is prompted for additional information to specify what submenu operation is desired. Using the main menu shown in Figure 3-2, the user may select data entry/update, query, report generation, or file maintenance options.

3.2.1 Entry/Update Function

The entry/update function allows the user to enter new data as well as to update information already in the SIRS database. Figure 3-3 presents the entry/update menu. Although data entry and data update are similar, there are differences in their execution. When entering new data, the user calls up the

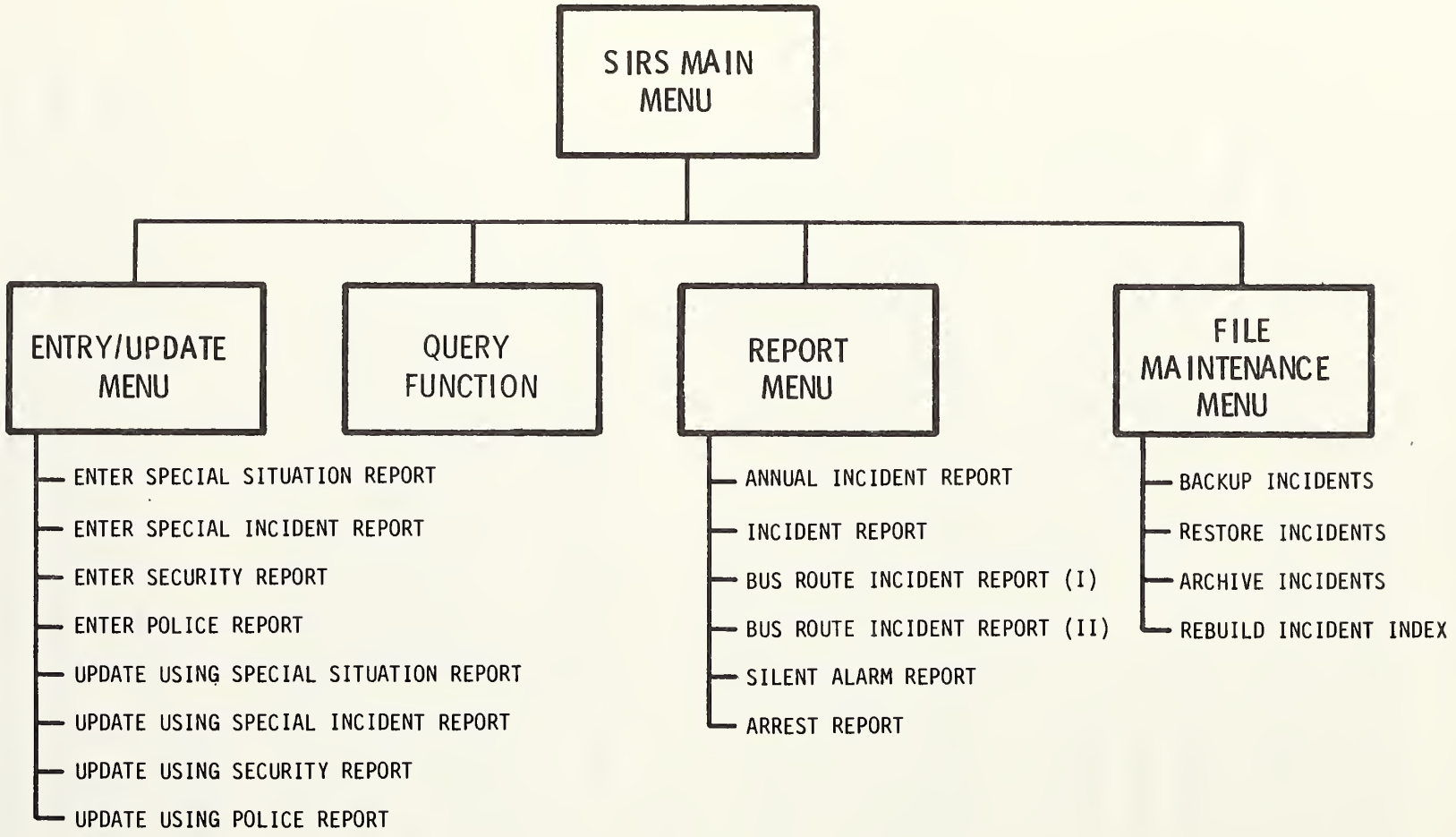


FIGURE 3-1. SIRS MENU STRUCTURE

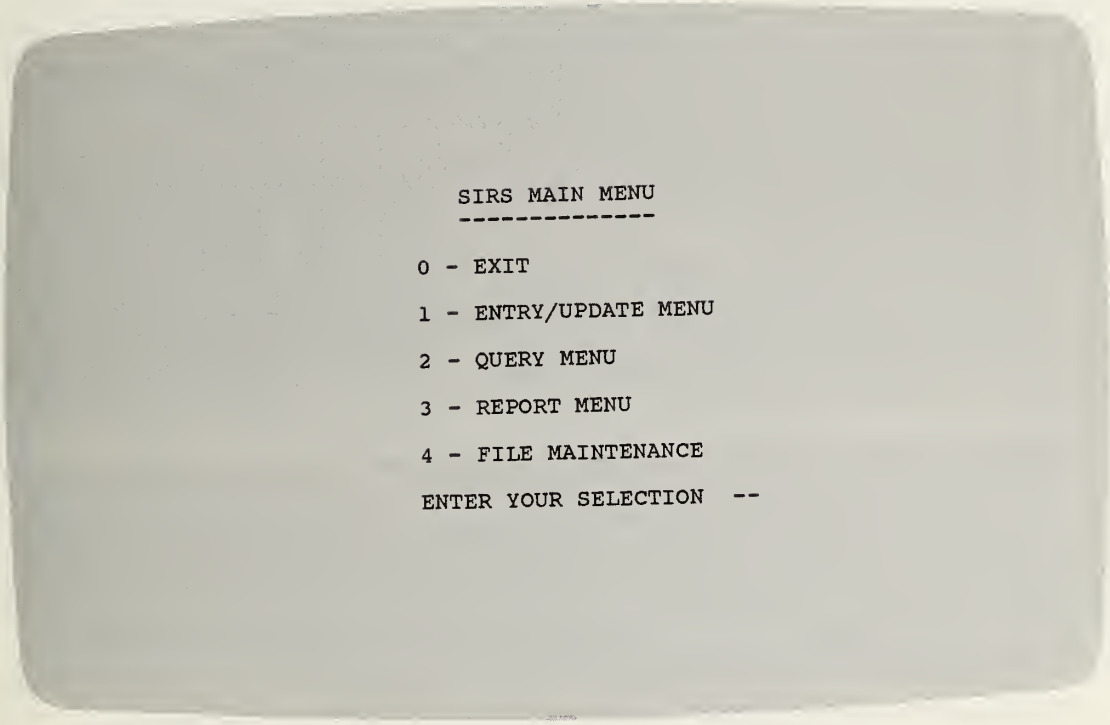


FIGURE 3-2. SIRS MAIN MENU

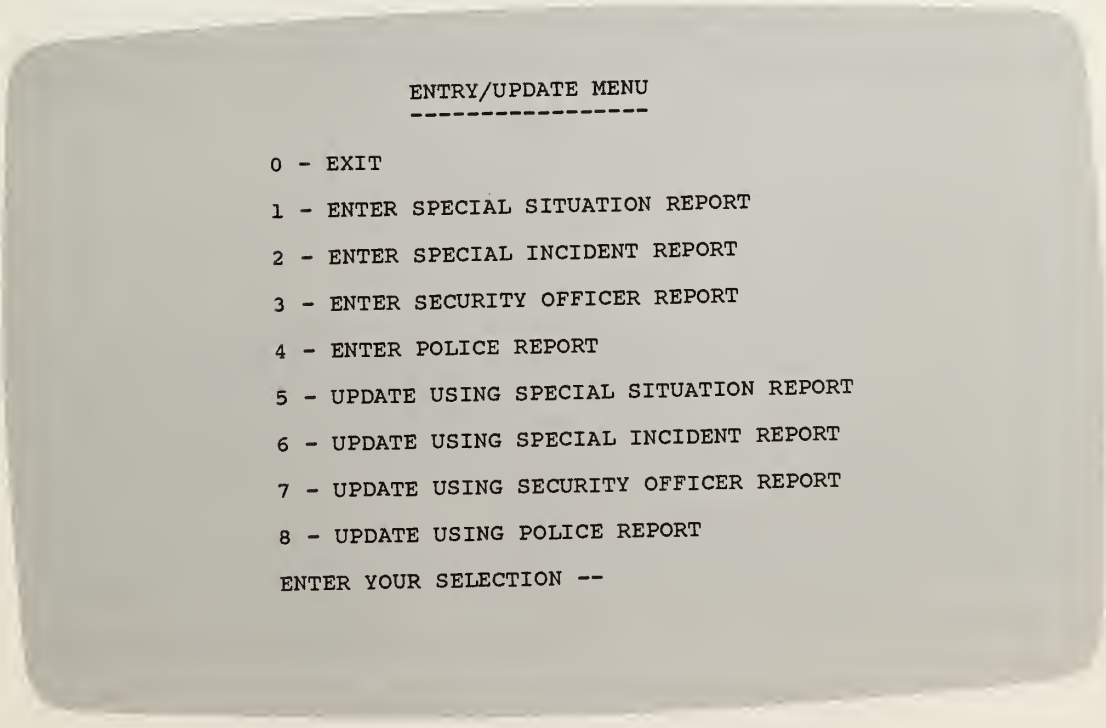


FIGURE 3-3. ENTRY/UPDATE MENU

data entry screen and fills in the blanks with new information. When updating existing data, the user must first retrieve the original incident record and then add to or modify that record.

To enter new data, the user selects the data entry screen corresponding to the input form from which data is to be entered. The user transfers data from the hardcopy report to the corresponding blanks on the screen. After data entry is complete, the program prompts the user, "Do you wish to enter this data? (Y/N)." A "Yes" response instructs the program to enter the data into the SIRS database, thus creating a new incident record. A "No" response returns the user to the entry/update menu. Figure 3-4 shows a data entry screen with data filled in for a Special Situation Report.

The data update function allows the addition of new data or the modification of existing data for a record already in the SIRS database. To update data, the original incident record must be retrieved from the database. For this purpose, the user needs to know specific identifying information, such as incident date, bus number, and route number. If such information is available, the user can use the data update function to retrieve the record. Figure 3-5 shows the data update screen with identifying information entered in the appropriate places. Figure 3-6 displays the incident record retrieved from the database.

If the information on date, bus number, and route number is unavailable or its accuracy is in doubt, the query function, described in the following section, provides an alternative method of locating the original report.

3.2.2 Query Function

The query function has the dual capability of retrieving incident records from the database and of providing statistical data upon request. As noted above, the query function can be used to scan the database and locate a specific record. The user may wish to locate these records for data update or for retrieving information on a specific incident.

To obtain statistical data using the query function, the user selects from among the following criteria: date, time of day, incident category, route

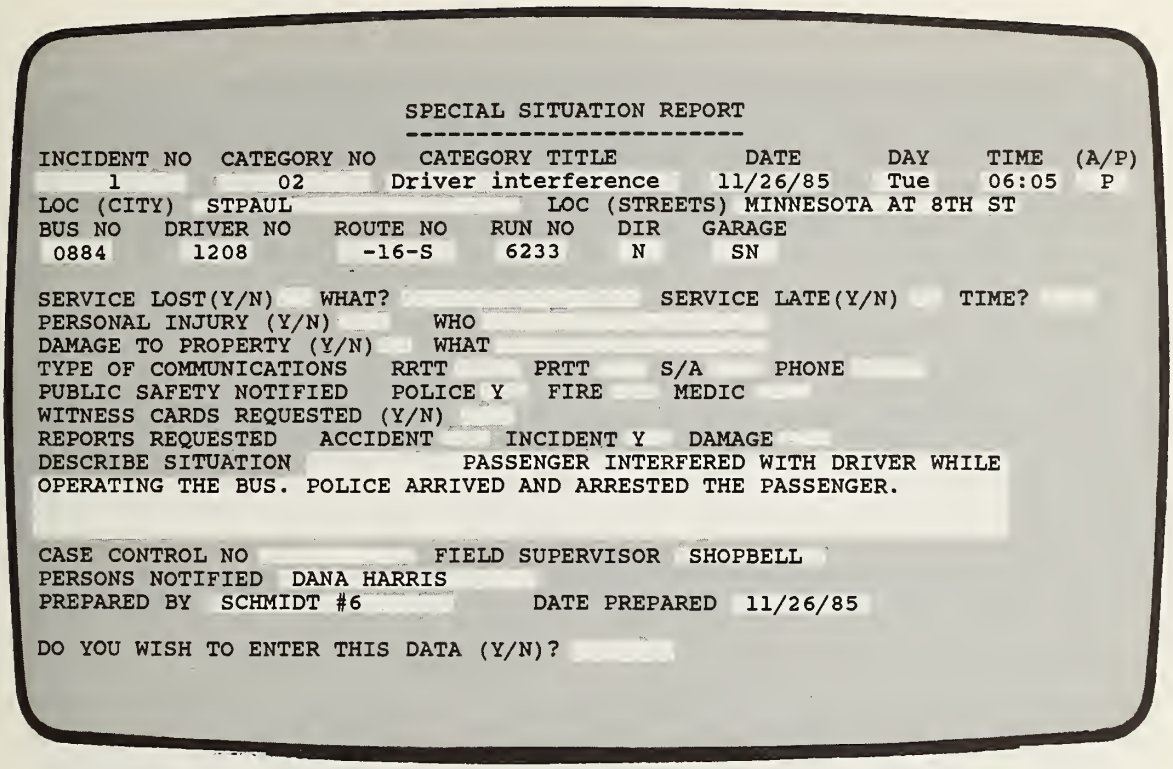


FIGURE 3-4. DATA ENTRY SCREEN FOR SPECIAL SITUATION REPORT

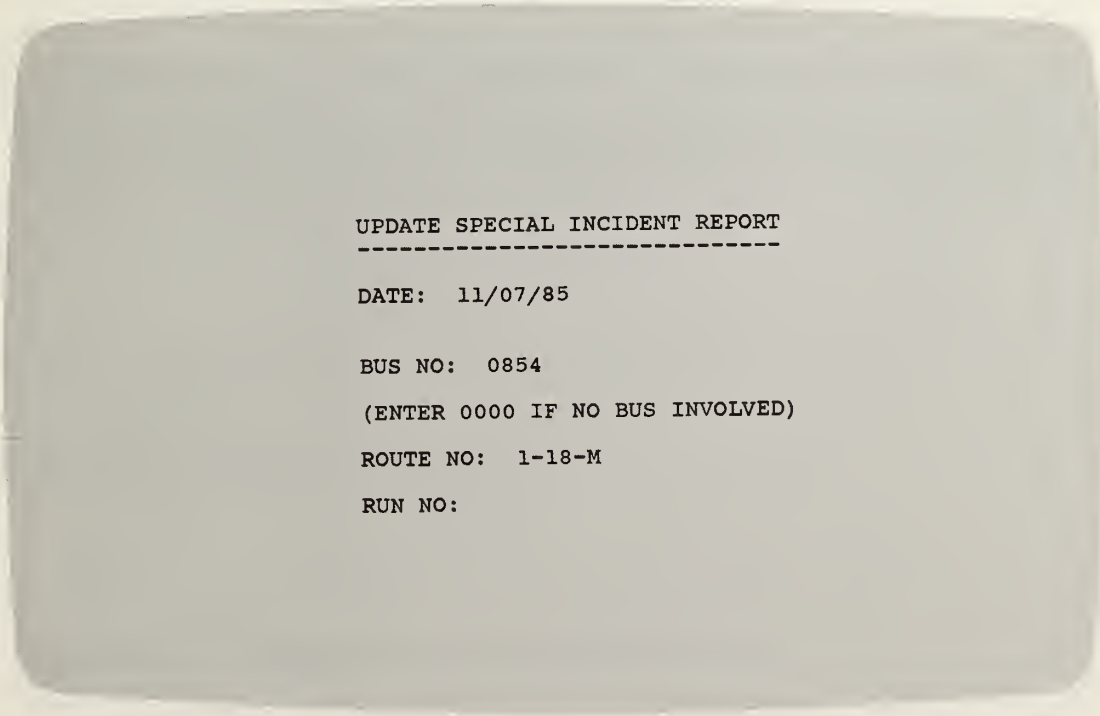


FIGURE 3-5. DATA UPDATE SCREEN

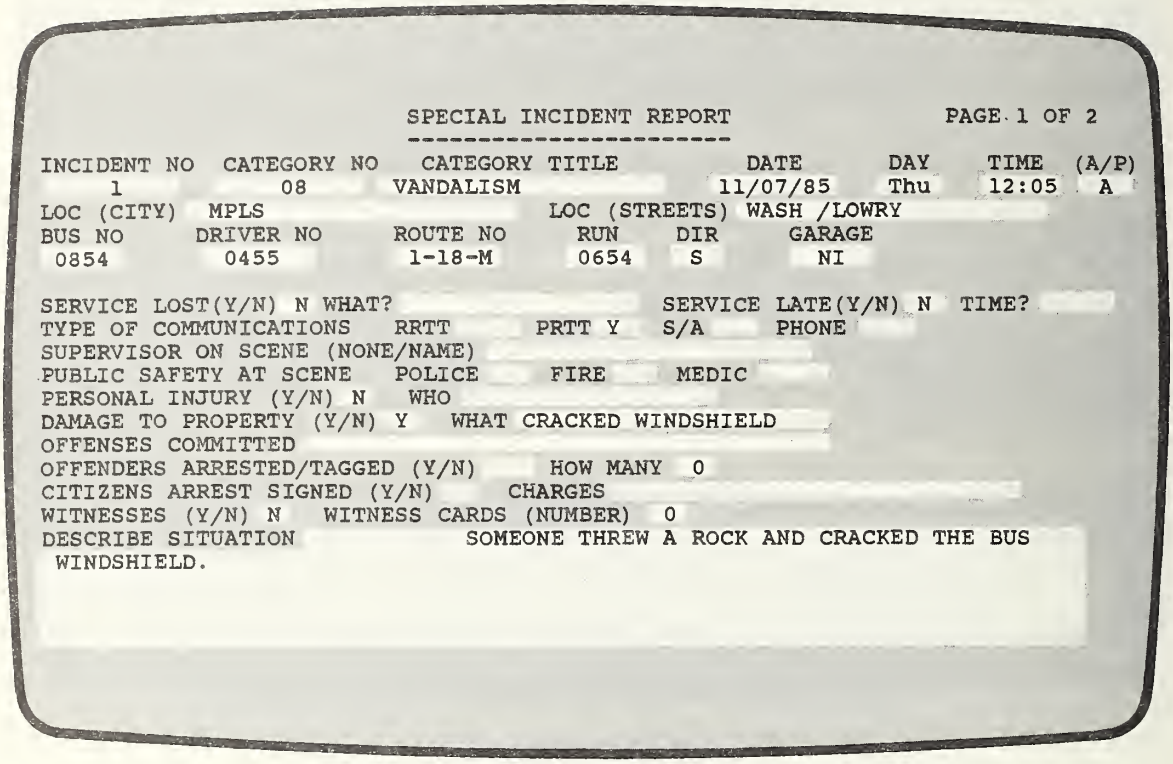


FIGURE 3-6. INCIDENT RECORD FOR DATA UPDATE

number, run number, direction of travel, location, and arrest (yes/no). The user may select any or all of these data elements as defining criteria for a set of incidents. Following criteria selection, the database is searched for corresponding incidents. The total number of such incidents is displayed on the screen. Next, the user has the option of "paging through" all incident records matching the selected criteria.

An example of a statistical data request might be to determine the number of incidents of fare evasion during the month of November. Figure 3-7 shows the query screen with data entered to request incidents of fare evasion (incident category "01") for the month of November, 1985. The number of incidents matching these criteria (in this instance, 30) is displayed at the bottom of the same screen after a search of the database. The user may subsequently view each of the incident records matching these criteria.

3.2.3 Report Function

The report menu (Figure 3-8) allows the user to select from a series of summary reports.

```
                INCIDENT QUERY
                --------------

START DATE : 11/01/85     END DATE : 11/30/85

START HOUR :     (A/P)    END HOUR :     (A/P)

BUS NUMBER       :

ROUTE NUMBER     :  -  -

RUN NUMBER       :

CATEGORY NUMBER : 01

NUMBER OF INCIDENTS :     30

DO YOU WISH TO DISPLAY FIRST INCIDENT (Y/N) ?
```

FIGURE 3-7. INCIDENT QUERY AND RESPONSE FOR FARE EVASION

```
                REPORT MENU
                -----------

   0 - EXIT

   1 - ANNUAL INCIDENT REPORT

   2 - INCIDENT REPORT

   3 - BUS ROUTE INCIDENT REPORT (TIME PERIOD,DAY-OF-WEEK)

   4 - BUS ROUTE INCIDENT REPORT (TIME PERIOD)

   5 - SILENT ALARM REPORT

   6 - ARREST REPORT

   ENTER YOUR SELECTION --
```

FIGURE 3-8. REPORT MENU

The "Incident Report" (Figure 3-9) summarizes incidents by category; by location (Minneapolis, St. Paul, suburbs); by personnel handling the incident (transit employee, security officer, police officer); and by whether the incident resulted in personal injury, property damage, lost time, or arrest. The user may select the range of dates and incident categories to be included in the report.

The "Annual Incident Report" provides a summary of all incidents occurring during a given year by incident category. Figure 3-10 provides a sample annual incident report, shown here as printed output rather than as a screen display.

INCIDENT REPORT

FROM 11/01/85 TO 11/03/85 PAGE NO. 1
FROM CATEGORY 01 TO 05 04/01/86

	INCIDENTS											
	LOCATION				HANDLED BY			RESULTED IN				
CATEGORY	MPLS	SP	SUB	UNK	TRAN SPVR	SEC OFF	POL	PERS INJ	PROP DAMG	TIME LOSS	ARREST	TOTAL
01	2	0	0	0	0	2	0	0	0	0	0	2
02	1	0	0	0	0	1	0	0	0	0	0	1
03	12	8	0	0	0	20	0	0	0	0	0	20
04	1	0	0	0	1	0	1	0	0	1	0	1
05	2	0	0	0	2	0	1	1	0	1	1	2

REPORT COMPLETED !
Press any key to continue...

FIGURE 3-9. INCIDENT REPORT

ANNUAL INCIDENT REPORT FOR 1985 PAGE NO. 1
07/15/86

CAT	DESCRIPTION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
01	Fare dispute/evasion	12	18	13	18	11	8	12	18	16	21	30	26	203
02	Driver interference	7	15	11	16	3	3	4	3	10	17	9	6	104
03	Prohibited activity	5	28	14	66	37	65	70	77	84	158	158	141	903
04	Drvr-assault/threat	9	6	5	3	6	5	9	9	9	10	7	11	89
05	Psgr-assault/threat	7	7	7	10	9	17	7	12	4	6	13	2	101
06	Theft	0	2	7	2	3	5	9	1	0	1	1	6	37
07	Robbery	1	0	0	1	1	0	0	2	0	4	4	0	13
08	Vandalism	3	19	27	28	23	20	19	32	22	28	29	17	267
09	Intoxicated person	20	38	35	52	26	19	36	44	41	50	72	70	503
10	Misc security relatd	6	8	7	8	19	21	17	51	52	35	39	66	329
11	Misc transp. related	32	27	23	23	29	27	18	12	22	31	37	46	327
12	Uninvolved witness	5	9	6	2	12	12	8	8	10	6	8	9	95
13	Silent alarm, real	4	3	2	2	1	6	6	2	6	1	4	2	39
14	Silent alarm, false	20	13	22	23	13	3	12	12	19	20	32	33	222
15	Lost/late service	35	32	31	24	38	10	22	4	13	15	48	33	305
16	Vehicle accident	64	35	61	30	28	29	31	37	39	43	71	87	555
17	Passenger accident	20	11	11	2	13	7	5	6	6	15	12	17	125
18	Pedestrian accident	2	1	1	2	4	2	5	1	2	0	1	4	25
19	Illness/injury-drvr	6	4	4	6	9	3	9	7	6	5	8	13	80
20	Illness/injury-psgr	6	11	8	7	15	3	5	11	11	9	15	11	112
	TOTALS	264	287	295	325	300	265	304	349	372	475	598	600	4434

FIGURE 3-10. ANNUAL INCIDENT REPORT

BUS ROUTE INCIDENT REPORT
(TIME-PERIOD,DAY-OF-WEEK)

PAGE NO. 1
04/01/86

FROM 11/01/85 TO 11/05/85
FROM CATEGORY 01 TO 10

LOCATION	TIME PERIOD	DAY-OF-WEEK	ROUTE NUMBER	FREQUENCY
MPLS	10:00 AM - 4:00 PM	FRI	0-21-M	2
MPLS	4:00 PM - 10:00 PM	MON	0-05-M	3
MPLS	4:00 PM - 10:00 PM	TUE	0-05-M	6
MPLS	4:00 PM - 10:00 PM	FRI	0-17-M	3
MPLS	4:00 PM - 10:00 PM	FRI	0-05-M	2
MPLS	4:00 PM - 10:00 PM	SAT	0-05-M	5

Press any key to continue...

FIGURE 3-11. BUS ROUTE INCIDENT REPORT

The "Bus Route Incident Report" (Figure 3-11) summarizes incidents by bus route. The user may select to report on only those routes with incident frequency greater or equal to any specified number "N." In addition to bus route, these reports summarize incidents by time period (in 4-hour segments), location, and day-of-week. There are two bus route incident reports, identical except that the first contains an additional breakdown by day-of-week.

The "Silent Alarm Report" (Figure 3-12) provides a listing of all incidents involving the use of silent alarms, and indicates the date, bus number, driver number and supervisor's name associated with the silent alarm incident, as well as whether the alarm proved to be real or false.

The "Arrest Report" (Figure 3-13) lists all incidents which resulted in arrest, indicating date, incident category, time of arrest, jurisdiction, muncipal police case control number, and case disposition.

SILENT ALARM REPORT

PAGE NO. 1
07/15/86

FROM 11/02/85 TO 11/06/85
FROM CATEGORY 05 TO 14

CAT	DATE	DAY	BUS NO	DRV NO	SUPERVISOR	FALSE ALARM	REAL ALARM
05	11/05/85	Tue	1470	0350	DAVE JONES	0	1
12	11/04/85	Mon	0906	1551	DEAN SULLIVAN	0	1
14	11/03/85	Sun	0584	1245	BARB GILMORE	1	0
14	11/04/85	Mon	0663	0048	JOE O'REILLY	1	0
14	11/05/85	Tue	0832	0000	ROBERT SMITH	1	0
14	11/06/85	Wed	0665	1285	MIKE O'CONNOR	1	0
					TOTALS	4	2

REPORT COMPLETED !
Press any key to continue...

FIGURE 3-12. SILENT ALARM REPORT

ARREST REPORT

PAGE NO.1
07/15/86

FROM 11/08/85 TO 11/13/85
FROM CATEGORY 01 TO 20

CAT	CCN	DATE	TIME	JURISDICTION	DISPOSITION
03	85236332	11/08/85	06:28P	MPLS	ARRESTED
03	85237184	11/09/85	07:50P	MPLS	ARRESTED
03	85239860	11/13/85	07:20P	SP	ARRESTED
10	85236346	11/08/85	06:24P	MPLS	ARRESTED
10	85239896	11/13/85	08:29P	MPLS	ARRESTED
10	85239735	11/13/85	08:30P	MPLS	ARRESTED

REPORT COMPLETED !
Press any key to continue...

FIGURE 3-13. ARREST REPORT

3.2.4 File Maintenance

The file maintenance menu shown in Figure 3-14 allows the user to perform four utility operations: backup, restore, archive and rebuilt incident index.

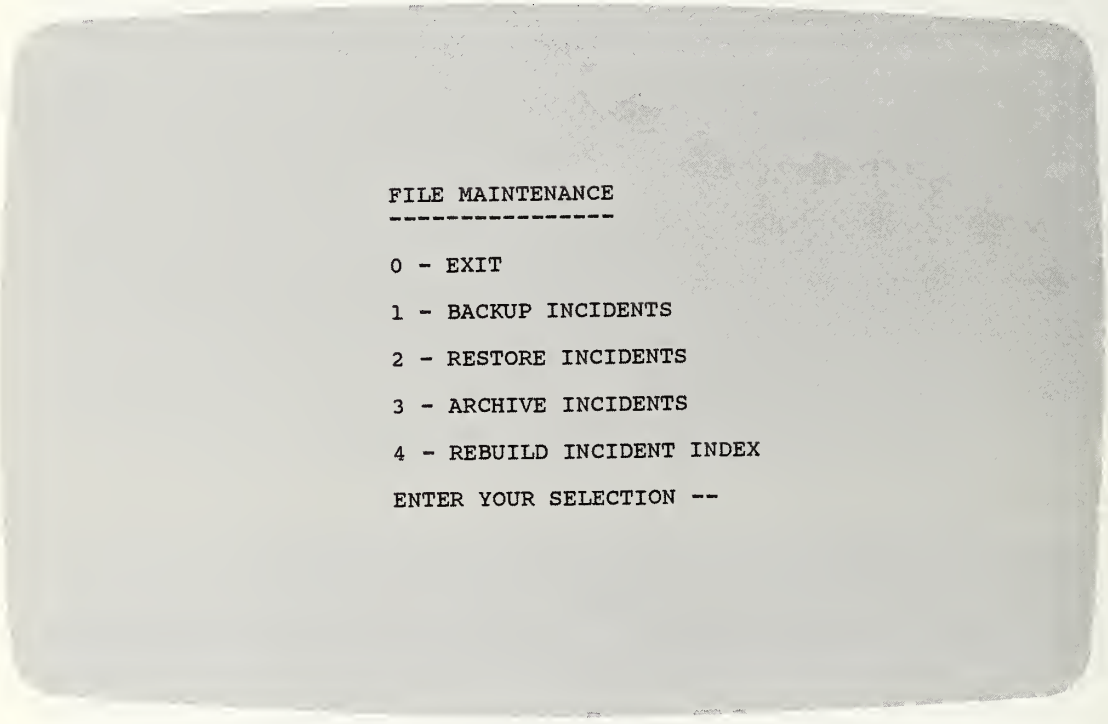


FIGURE 3-14. FILE MAINTENANCE MENU

The backup incidents function allows the user to copy data from the hard disk to a floppy disk for storage purposes. Because hardware failure is always possible, it is advisable to have data backed up on floppy disks. If the system should "crash," data on the hard disk might be lost, but could be retrieved at a later point from the floppy disk backup copy. If possible, data should be backed up on a daily basis. Since there is limited disk storage space, the user

must be cognizant of the maximum number of incident records that an individual disk can hold so as not to overflow disk storage space.

The restore incidents option reverses the storage functions of backup by copying data from a floppy disk back onto the hard disk. This option can be used to restore backup data in case of inadvertent data loss.

The archive incidents function is used when data are to be stored on a permanent basis. The archive option allows the user to transfer data from the hard disk to a floppy disk and, in the process, to erase the hard disk data. This option is used primarily when the quantity of data on the hard disk is so large that it is slowing down processing time and should be reduced. In such cases, data no longer in active use are "archived," that is, transferred to floppy disks for storage.

The final menu item, the rebuild incident index option, allows the user to reconstruct the SIRS index files. The use of index files allows the program to operate in a more rapid and efficient manner. Index rebuilding is necessary when the database structure has been changed or when the index files are inadvertently damaged, as in the case of hardware failure.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL APPLICABILITY OF SIRS

Although demonstrated and deployed at MTC, SIRS was designed to be flexible enough to meet the requirements of bus systems in general. For systems with characteristics parallel to those of MTC, SIRS is directly transferable. For transit systems with different characteristics, SIRS would need modification prior to implementation. Some pertinent operational characteristics which may vary from system to system are discussed below.

The nature of patrol activities is one such characteristic. Because MTC uses on-board patrols, SIRS aggregates security incidents by bus route. This aggregation is useful in deploying security forces on high-incident bus routes. However, for transit systems which use vehicle patrols, aggregation of security incidents by geographical units may be more useful. An example of such a system is the computerized mapping program of the Southeast Michigan Council of Governments (SEMCOG), which aggregates security incidents by police precinct.

Another variable characteristic is the procedure used in reporting security incidents. The four reporting forms incorporated into SIRS may not directly correspond with those reporting forms used by other transit systems. However, modifications to include or exclude various reporting forms can easily be accomplished.

Finally, transit systems vary according to whether they patrol bus stops and report bus stop security incidents. Although MTC does not routinely patrol bus stops, SIRS includes a special code indicating that an incident occurred at a bus stop rather than on-board a bus. For transit systems which routinely patrol bus stops or which receive municipal police reports on bus stop incidents, this data could represent a large percentage of reported security incidents.

4.2 ENHANCEMENTS/MODIFICATIONS TO SIRS

Due to the reporting procedures in use at MTC, SIRS must accomodate input from as many as four reporting sources (dispatcher, driver, security officer, and police officer) for any given incident. In SIRS as demonstrated at MTC, there is no control number linking the various input report forms based on the incident they describe. Instead, SIRS matches incoming report forms using information such as date, bus number and route number. This method can result in either over-counting or under-counting of the actual number of incidents. Some transit systems use control numbers to link reports corresponding to the same incident, and SIRS could be modified to accommodate such a control number system. In fact, the use of such a system would increase the accuracy of SIRS.

At MTC, all incidents, security and nonsecurity alike, are reported on the same reporting forms and are included in the SIRS database. An advantage of including all incidents is that MTC can use SIRS to aggregate and analyze safety-related as well as security-related incidents. SIRS is flexible enough that it could be expanded to include a safety incident reporting system in addition to the current security incident reporting system. On the other hand, the inclusion of nonsecurity incidents as part of the SIRS database slows down the operation of the present system.

4.3 INDUSTRYWIDE ISSUES

Many studies in the transit security field have recommended the development of a uniform transit crime reporting system as a necessary step in improving transit security (Levine and Wachs, 1985; Hargadine and Scott, 1985; Mauri, Cooney and Prowe, 1984). Uniform statistics would allow a more accurate assessment of the nature and scope of transit security issues and thereby assist in the development of appropriate countermeasures.

An important step toward establishing such a uniform transit crime reporting system would be an industry consensus on how transit security incidents should be categorized. The Uniform Crime Reporting system (UCR) used by police departments to report statistics to the FBI is a good starting point. The problem with the UCR system when applied to transit security incidents is

two-fold: 1) its primary emphasis is on felony crime whereas the bulk of transit crime consists of misdemeanors and local ordinance violations, and 2) the UCR categorization does not refer specifically to the transit environment.

In recent years the Southeast Michigan Council of Governments (SEMCOG) has developed a transit crime categorization which modifies the UCR system to make it more suitable for transit application. SIRS does not incorporate the SEMCOG definitions because they are not presently used at MTC. However, SIRS could be modified to include the SEMCOG classification system.

An impediment to establishing a uniform transit crime reporting system is inconsistent reporting of transit security incidents on the local level. Transit system personnel do not always report incidents which they observe, and municipal police may fail to inform transit agencies of security incidents which they have covered. To improve the reporting practices of municipal police, it has been suggested that the UCR system be revised to include transit crime as a distinct category (Levine and Wachs, 1985). Such a revision would insure that transit security incidents currently included in overall crime statistics could be separated out. In addition to improved police reporting, transit systems must improve their own reporting practices. Better communication between transit agencies and police departments with regard to reporting procedures would also improve the present situation.

Although a computerized system such as SIRS will not solve these problems in and of itself, it can act as a catalyst to prompt better reporting practices by transit system employees and municipal police departments.

4.4 FUTURE EFFORTS

At the present time, SIRS has been successfully demonstrated at MTC in Minneapolis/St. Paul. A similar, more sophisticated system, the Advanced Transit Crime System (ATACS), has been developed by the Southeast Michigan Council of Governments and implemented in Detroit. Future efforts should be directed toward demonstrations of these software packages at other transit systems to evaluate their general applicability and utility. While these demonstrations would be initiated on an individual basis, some form of coordination among transit systems would be desirable. Such coordination would

expedite information-sharing, and thus maximize the benefits to the industry as a whole. Optimally, these demonstrations would also address improvements in security incident reporting practices on the part of transit systems and municipal police departments, as well as the development of a uniform security incident reporting system for the industry as a whole.

APPENDIX

MTC SECURITY INCIDENT REPORTING FORMS

Form 890 - Rev 2/86

SPECIAL SITUATION REPORT (SSR)

(See Reverse Side for Instructions)

CATEGORY NUMBER	CATEGORY TITLE	DATE	DAY	TIME
LOCATION (CITY)	LOCATION (STREETS)			

BUS NUMBER	DRIVER NUMBER	ROUTE NUMBER	RUN NUMBER	DIRECTION	GARAGE

YES NO

_____ _____ (1) Service Lost? What? _____

_____ _____ (2) Service Late? Time? _____

_____ _____ (3) Personal Injury? Who? _____

_____ _____ (4) Damage to Property? What? _____

_____ _____ (5) Communications used? RRTT _____ PRTT _____ S/A _____ Phone _____

_____ _____ (6) Public Safety notified Police _____ Fire _____ Medic _____

_____ _____ (7) Witness Cards requested? _____

_____ _____ (8) Other reports requested? Accident _____ Incident _____ Damage _____

(9) Describe situation (who-what-when-where-why-how) _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(10) If police report made, provide Case Control Number _____

(11) Field Supervisor _____

(12) Persons Notified _____

Report Prepared By _____ Date _____

FIGURE A-1. SPECIAL SITUATION REPORT

Form 890 - Rev 2/86

SPECIAL INCIDENT REPORT (SIR)

(See Reverse Side for Instructions)

CATEGORY NUMBER	CATEGORY TITLE	DATE	DAY	TIME
LOCATION (CITY)	LOCATION (STREETS)			

BUS NUMBER	DRIVER NUMBER	ROUTE NUMBER	RUN NUMBER	DIRECTION	GARAGE

YES NO

_____ _____ (1) Service Lost? What? _____

_____ _____ (2) Service Late? Time? _____

_____ _____ (3) Personal Injury? Who? _____

_____ _____ (4) Damage to Property? What? _____

_____ _____ (5) Communications used? RRTT _____ PRTT _____ S/A _____ Phone _____

_____ _____ (6) Public Safety notified Police _____ Fire _____ Medic _____

_____ _____ (7) Witness Cards requested? _____

_____ _____ (8) Other reports requested? Accident _____ Incident _____ Damage _____

(9) Describe situation (who-what-when-where-why-how) _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(10) If police report made, provide Case Control Number _____

(11) Field Supervisor _____

(12) Persons Notified _____

Report Prepared By _____ Date _____

FIGURE A-2. SPECIAL INCIDENT REPORT

Metropolitan Transit Commission

Security Personnel Duty Report

Saint Paul / Minneapolis / Other _____ (Circle Correct One)

Date _____ Day _____ Time Duty Start _____ Time Duty End _____ Page ___ of ___ Pages

LINE #	Bus No. or Garage	Rt. No. or Area	On Bus/At Garage		Off Bus/Leave Garage		Driver/Supervisor Signature	Driver No.	Circle Number of Officers
			Time	Location	Time	Location			
1									1 2
2									1 2
3									1 2
4									1 2
5									1 2
6									1 2
7									1 2
8									1 2
9									1 2
10									1 2
11									1 2
12									1 2
13									1 2
14									1 2
15									1 2
16									1 2

INSTRUCTIONS: Please list on reverse side any disturbance or need for police service you encounter. Forward completed form to MTC. Operations Department, 3118 Nicollet Avenue, Minneapolis, MN 55408

SUBMITTED BY: I/we have conducted bus/garage surveillance as indicated.

TOTAL PAY TIME

Signature _____ MTC Badge No. _____ Hours ____ Minutes ____

Signature _____ MTC Badge No. _____ Hours ____ Minutes ____

FIGURE A-3. SECURITY OFFICER DUTY REPORT

Incident Report Details

Saint Paul / Minneapolis / Other _____ (Circle Correct One)

Page ____ of ____ Pages

LINE #	Bus No. or Garage	Rt. No. or Area	Time	Location	Details (Brief Summary)	Disposition (Case #)

NOTE: Use additional plain paper, if necessary, and identify other police involved, if appropriate.

Signature _____ Date _____

Signature _____ Day _____

01/29/82

FIGURE A-3. SECURITY OFFICER DUTY REPORT (CONTINUED)

ARREST/CITATION REPORT
MINNEAPOLIS POLICE DEPARTMENT
MPD 6006 R(6-82)

CODE	CASE CONTROL NO.

DATE OF ARREST	TIME OF ARREST	LOCATION OF ARREST	PREC

DATE OF CRIME	TIME OF CRIME	TRAFFIC	MISD.	FELONY	WARRANT	CITIZEN	BOOKED	CITATION NO

CHARGES

PRISONER'S NAME *(First-Middle-Last)*	CHECK IF HISPANIC ☐	D.O.B	AGE	JUVENILE

HOME ADDRESS	HOME PHONE	BUSINESS ADDRESS	BUSI. PHONE
ALIASES/NICKNAMES		OTHER KNOWN ADDRESSES	OTHER PHONE
IF JUVENILE, PARENT'S NAMES		PARENT'S ADDRESS	PARENT'S PHONE

PRISONER INFO

VEH. YEAR	MAKE	MODEL	COLOR	LICENSE NO.	STATE	DRIVERS LICENSE NO.	STATE

1 WEAPON	2 MARITAL STATUS	3 RACE	4 SEX	5 HEIGHT	6 WEIGHT	7 BUILD	8 HAIR STYLE
1=REVOLVER 2=AUTOMATIC 3=OTHER H/GUN 4=RIFLE 5=SHOTGUN 6=SAWED S/GUN 7=DISAB. CHEMICAL 8=KNIFE 9=SHARP INSTRU. 10=BLUNT INSTR. 11=EXPLOSIVE	1=SINGLE 2=MARRIED	1=WHITE 2=BLACK 3=NATIVE AMER. 4=CHINESE 5=JAPANESE 6=ASIAN 7=ALAS. ESKIMO 8=UNKNOWN	1=MALE 2=FEMALE	1=UNDER 5'4" 2=5'5" - 5'8" 3=5'9" - 6' 4=6'1" - 6'3" 5=OVER 6'3"	1=UNDER 100# 2=100 - 140 3=140 - 160 4=160 - 180 5=180 - 200 6=200 - 225 7=OVER 225#	1=THIN 2=MEDIUM 3=STOCKY 4=MUSCULAR 5=OBESE	1=BALD 2=THINNING 3=SHORT 4=SHLDR. LG. 5=AFRO, MED. 6=AFRO, LGE 7=PROCESSED 8=CURLY 9=STRAIGHT 10=WAVEY

9 HAIR COLOR	10 WIG	11 FACIAL HAIR	12 MASK	13 TEETH	14 TATTOO	15 HANDED	16 DEFORMITIES	17 SPEECH	18 PHYSICAL/ MENTAL
1=BLACK 2=BLOND 3=BROWN 4=RED 5=GRAY 6=SANDY 7=SALT/PEPPER 8=WHITE 9=FROSTED 10=OTHER	1=FULL 2=PARTIAL	1=NONE 2=UNSHAVEN 3=NEAT BEARD 4=FULL BEARD 5=SM. MUST. 6=LGE. MUST.	1=FACE 2=DISGUISE 3=STOCKING 4=SKI	1=MISSING UP 2=MISSING DN. 3=GOLD UP 4=GOLD DN. 5=SILVER UP 6=SILVER DN. 7=OTHER	1=ARMS 2=HANDS 3=FACE 4=LEGS 5=CHEST 6=BACK	1=RIGHT 2=LEFT	1=FACE/HEAD 2=EYES 3=EARS 4=HANDS 5=ARMS 6=LEGS 7=TRUNK	1=REGIONAL 2=FOREIGN 3=SOUTHERN 4=STUTTER 5=LISP 6=EFFEMINATE 7=GRUFF 8=OBSCENE	1=RETARDED 2=EPILEPTIC 3=PHYS. H'CAP 4=SENILE 5=DISTURBED

NARRATIVE: *Give detailed account of offense and circumstances leading to arrest.*

ARRESTING CITIZEN/COMPLAINTANT	HOME ADDRESS	APART. NO	PHONE	CASE CONTROL NO.
WITNESS	HOME ADDRESS	APART. NO	PHONE	

REPORT MADE BY	OTHER REPORTS MADE	ARREST/S	OFFENSE	STATEMENT/S	PROP. INV.	AUTO IMPOUND
ACTUAL ARRESTING OFFICERS/PERSONS Store Detectives, Railway Police, etc.					EMPL. NO	SDD NO

CRIMINAL HISTORY

FIGURE A-4. MUNICIPAL POLICE INCIDENT REPORT

REFERENCES

1. Hargadine, Eileen O., and Gail Scott, Documentation and Assessment of Transit Security Data Reporting and Its Utilization, U.S. Department of Transportation, Urban Mass Transportation Administration, Report No. UMTA-MA-06-0111-85-1, Washington, DC, March 1985.

2. Levine, Ned, and Martin Wachs, Factors Affecting the Incidence of Bus Crime in Los Angeles, U.S. Department of Transportation, Urban Mass Transportation Administration, Report No. CA-06-0195, NTIS No. PB 85-190841/AS, Washington, DC, January 1985.

3. Mauri, Ronald, Nancy A. Cooney and Gary J. Prowe, Transit Security: A Description of Problems and Countermeasures, U.S. Department of Transportation, Urban Mass Transportation Administration, Report No. UMTA-MA-06-0152-84-2, Washington, DC, October 1984.

4. Southeast Michigan Council of Governments, An Analytical Safety and Security Reporting Program for Public Transportation in Southeast Michigan, U.S. Department of Transportation, Urban Mass Transportation Administration, Report No. UMTA-MI-06-0038, Washington, DC, June 1984.

80 copies